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Question Paper Code : 80133

B.E./B.Tech. DEGREE EXAMINATIONS, APRIL/MAY 2019.

Fourth Semester

Electrical and Electronics Engineering

EE 8403 — MEASUREMENTS AND INSTRUMENTATION

(Regulation 2017)

Time : Three hours   Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. Differentiate Accuracy and Precision.

2. Distinguish between Gravity control and Spring control.

3. Specify the use of copper shading bands. Where is it placed in the energymeter?

4. How the flux density is measured?

5. How Maxwell's bridge differ from Anderson bridge, although both are used for measuring inductance?

6. Specify the purpose of Wagner earthing device.

7. Mention the use of Lissajous patterns.

8. Specify the application of data loggers.

9. Mention the electrical phenomena used in transducers.

10. List the elements of DAQ system.

PART B — (5 × 13 = 65 marks).

11. (a) Explicate the static and dynamic characteristics of an instrumentation system.

Or

(b) Elaborate the working of Moving iron instrument and derive the torque equation of the Moving iron instrument.

12. (a) State Blondel's theorem and explain how the power measurement using two wattmeter method.

Or

(b) Describe the step by process involved in determination of B-H curve and hysteresis loop.

13. (a) Derive the expressions for measurement of unknown capacitance with a neat bridge circuit.

Or

(b) Derive the expressions for measurement of unknown inductance using Hays bridge.

14. (a) Explain in detail about the various types of Recorders.

Or

(b) Explain in detail about the LED and LCD displays.

15. (a) Elaborate the types of resistive and inductive transducers used for measuring pressure.

Or

(b) Elucidate the elements of data acquisition system.

PART C — (1 × 15 = 15 marks)

16. (a) A sinusoidal alternating voltage of amplitude, 100-V is applied across a circuit containing a rectifying device which entirely prevents current from flowing in one direction and offers a non-inductive resistance of 10 ohm to the flow of current in the other direction. Find the reading on (i) a hot wire, (ii) a moving coil ammeter in the circuit.

Or

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(b) A Maxwell's capacitance bridge shown in. Fig. 1 is used to measure an unknown inductance in comparison with capacitance. The various values at balance : R_2 = 400 ohm; R_3 = 600 ohm; R_4 = 1000 ohm; C_4 = 0.5 μF.

Calculate the values of R_1 and L_1. Calculate also the value of storage Q factor of the coil if frequency is 1000 Hz.
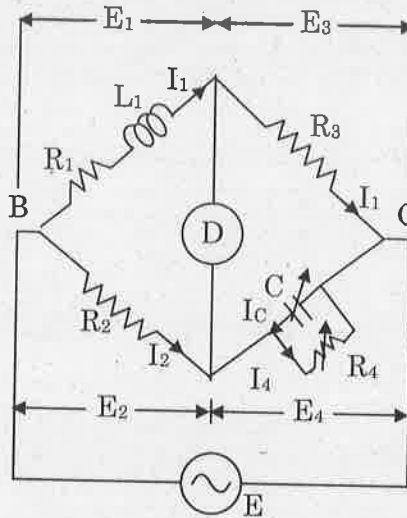

Fig. 1